2010 Minnesota Spring Turkey Hunter Survey Report

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In Minnesota, the spring wild turkey hunting season is designed to regulate harvest and distribute hunting pressure by allocating permits across 77 permit areas (PAs) and 8 time periods (6, 5-day [Time Periods A – F] and 2, 7-day [Time Periods G – H]) using a quota system. The Minnesota Department of Natural Resources (MNDNR) attempts to issue the optimum number of permits to satisfy hunter demands while maintaining sustainable turkey populations and quality of hunting (Kimmel 2001, MNDNR 2007).

The objective of the spring turkey-hunter survey is to monitor hunter satisfaction and associated factors, including interference rates (between hunters), and relative ease of access to hunting land. We also used the 2010 spring turkey-hunter survey as a pilot study to evaluate the feasibility of collecting response data via the internet (vs. mail-back surveys).

Methods

We randomly selected 2,421 hunters (resident and non-resident) that purchased a 2010 spring turkey-hunting license from 5 PAs (344, 345, 346, 348, and 349) based on Electronic Licensing System (ELS) database. Hunter samples were randomly selected for all 8 time periods (i.e., April 14 – May 27, 2010). To evaluate the feasibility of using the internet to collect response data, hunters were randomly assigned to 1 of 3 treatment groups based on the method of response: mailback, mixed-mode, and internet. The mailback group received a postage-paid paper survey that could be completed and

returned via U.S. mail. The mixed-mode and internet groups received a postcard with a Uniform Resource Locator (URL) address for the survey website and were instructed to go to the website to complete the survey. Internet respondents (mixed-mode and internet treatment groups) were required to enter a unique identification number to prevent multiple responses by the same respondent or unverifiable responses (unknown respondents). The first mailing (to all 3 groups) was sent out on 7 June 2010. One follow-up mailing was sent to non-respondents (for all 3 groups) on 26 July 2010. Non-respondents from the mailback and mixed-mode groups received a postage-paid mailback survey for the second mailing, whereas the internet group received a second postcard reminding them to visit the website to complete the survey.

We also conducted a follow-up survey (postage-paid mailback survey) of non-respondents from the internet-only treatment group. The objective of the follow-up survey was to determine reasons for not responding (e.g., did not want to participate, did not own a computer or have access to internet, security concerns over using the internet, technical problems that precluded them from responding). Follow-up surveys were mailed on 26 August 2010.

Results

The overall response rate after 2 mailings was 61%, but it varied by permit area, and especially, treatment group (Table 1). The lowest per-mailing response rates (range: 20–34%) were from hunters that received postcards directing them to a website (i.e., internet group and first mailing to mixed-mode group; Table 1). Conversely, per-mailing response rates in mail-back surveys ranged from 39–61%. Likewise, the overall response rate was lowest for the internet group (44%, 95% CI: 42–46%), highest for the mailback

group (74%, 95% CI: 72–76%), and intermediate for the mixed-mode group (65%, 95% CI: 63–67%). Response rate by time period ranged from 7% (time period H) to 17% (time period E). Sixteen surveys were undeliverable due incorrect address in the ELS database.

Mean hunt- quality scores, interference rates, and ease of access (to hunting land) ratings were similar among treatment groups (Table 2). Therefore, we pooled data for the 3 treatment groups. The overall mean hunt-quality score was 3.3 (scale: 1 = poor to 5 = excellent) and ranged from 3.2 (PA 345) to 3.4 (PA 344). The most important factor in determining hunt quality was "seeing turkeys/calling birds in/hearing gobbling" (PAs 345, 346, 348, 349) or "spending time with family and friends" (PA 344; Table 3). Twenty-three percent of hunters responded "definitely yes" or "somewhat" that another hunter kept them from hunting where they intended (Table 4). Eighty-nine percent of hunters stated that another hunter did not interfere with their chance to harvest a turkey (Table 5). Interference rates (i.e., proportion of hunters reporting that another hunter interfered with their ability to harvest a turkey) were 10% (PAs 345, 346, 348, and 349) and 18% (PA 344). The majority (56%) of interference that was reported occurred on private land and with an average of < 1 day of interference occurring (Table 5). Of the 44% of interference reported on public land, 55% occurred in PA 344, which primarily consist of Whitewater Wildlife Management Area. Seventy-four percent of hunters reported access to hunting land as "somewhat easy" or "very easy" with 70% of hunters indicating they hunted private land, 16% public land, and 13% hunted private and public land (Table 6). Thirteen percent of private land hunters were landowners, 3% tenants, and 84% did not identify themselves as a landowner or tenant (Table 7). Thirty-four

percent of hunters who hunted exclusively public land indicated they hunted public land because they could not gain access to private land. Eleven percent of hunters felt turkey numbers increased, 35% thought they decreased, 47% about the same, and 7% hunted a different PA (Table 8).

Mean respondent age ranged from 49 (PA 344) to 52 (PA 349) and was similar among treatment group; 50 (mailback), 50 (mixed-mode), and 51 (internet). Seventy-five percent of respondents purchased a spring turkey lottery license (i.e., general lottery or landowner), 23% surplus, 2% non-resident general lottery, and < 1% non-resident surplus permits. Ninety-eight percent of respondents reported that they hunted (mean days hunted = 3) and 30% reported successfully harvesting a turkey Seventy-seven percent of respondents indicated they do not live in the PA they generally hunt, 52% applied or hunted in the same area they hunted in 2010; 18% 2 of the last 3 seasons; 18% 1 of the last 3 seasons; and 12% didn't apply or hunt in the same areas as they applied or hunted in 2010 (Table 9). Forty seven percent of respondents reported hunting each of the last 3 season (2007 – 2009), 20% 2 of the last 3 seasons, 22% 1 of the last 3 seasons, and 11% didn't hunt any of the last 3 seasons (Table 9).

Twenty-nine percent of the 492 "internet" non-respondents answered our follow-up survey about why they did not complete an internet survey. Hunters listed the following reasons for not responding to the "internet" survey (n = 142): do not own a computer or have access to the internet (41%), other (32%), did not want to participate in survey (16%), encountered technical problems trying to access the survey site (13%), concerned about privacy issues associated with using the internet (6%). Of those who indicated "other" as a reason for not responding (n = 50), 54% intended to respond but

forgot to complete it, 16% did not notice survey card in the mail, 8% lost or misplaced the survey card (containing the web address and survey id), 6% state their computer was not working at the time they received the survey card, 4% did not hunt during 2010, 4% stated that they were not "good" with using computers, 2% did not want to admit they were unsuccessful in harvesting a turkey.

Of those respondents that indicated they experienced technical problems accessing the survey site,13 respondents stated they could not find the survey site, 1 respondent could not complete the survey, and 1 reported their survey ID did not work. Of the respondents who attempted to respond but failed, 8 respondents tried to access the survey site using an internet based search engine (i.e., Google, Yahoo, Aol, Bing, etc), 6 used the browser address bar, 1 respondent had the DNR website saved in their internet favorites and tried to find the survey site on the DNR homepage.

Respondents were also given the opportunity to provide comments or suggestions on how to make an internet-based survey easier to use. Seventeen hunters stated they simply prefer mailback surveys, 2 stated the DNR should ask for e-mail addresses from hunters and conduct e-mail based surveys, 1 suggested making it similar to the Harvest Information Program (HIP) used for migratory bird data collection (i.e., ask survey questions when the buy a license the following year), 1 reported survey fatigue (i.e., asked to complete too many surveys), and 1 suggested making the survey phone-based rather than internet- based.

Discussion

Minnesota's harvest-management strategy is to maximize the amount of turkey hunting across each permit area while providing a safe, quality hunting experience. The factors

most often cited as contributing to a quality hunt include ease of access to hunting lands, a feeling of safety, proper distribution of hunters (i.e., lack of interference from other hunters), observing turkeys while hunting, having the opportunity to get a shot, and success in harvesting a turkey (Smith et al. 1992, Dingman 2003). Success is the most often cited factor influencing a quality hunting experience (Stankey et al. 1973, Hende 1974, Dingman 2003). Based on the results from this survey, hunters in the surveyed permit areas generally are experiencing a quality hunt (mean score = 3.3), which is characterized by relatively high success (mean = 30%), low interference rates (mean = 11%), relatively easy access to hunting land (74% of hunters reported finding a place to hunt as "somewhat easy" or "very easy"), and the majority of hunters (70%) hunted private land, indicating that access to hunting land does not appear to be an issue for most hunters.

The survey area covered southeastern Minnesota, which is where wild turkeys were initially reintroduced and where the first spring season was held in 1978. This area has the highest hunter density (mean = 0.7 permits/mi^2 of PA; Time Periods A-F) in the State, which is one factor that can contribute to increased interactions among hunters. Although hunter density is relatively high (compared to other PAs in the state), 89% of respondents reported that another hunter did not interfere with their chance to harvest a turkey. Furthermore, 84% of hunters reported that interference did not occur and over half of the interference that was reported occurred mostly on private land. Interference occurring on privately owned land would seem to be a hunter-landowner issue (i.e., landowner allowing multiple hunters on their land at the same time or hunters choosing to hunt land that they know other hunters are hunting). In PA 344, which contains a large

tract of publicly owned land (i.e., Whitewater Wildlife Management Area), 77% of hunters reported that interference did not occur and only 7% indicated that interference was the most important factor in determining a quality hunting experience for them. Overall, respondents indicated that the most important factor in determining a quality turkey hunting experience was "seeing turkeys/calling birds in/hearing gobbling." Hunters reported quality as slightly above average (mean score = 3.3) across all PAs and treatment groups, and hunters that successfully harvested a turkey rated quality slightly higher (mean score = 4.0), which is consistent with previous surveys that found success to be the most important factor in determining a quality turkey-hunting experience (Dingman 2003).

We also found a high level of turkey-hunter retention (i.e., 87% of respondents hunted in 2 of the last 3 years) and high fidelity to a turkey permit area (e.g., 70% of respondents applied or hunted 2 of the last 3 years in the same area they hunted in 2010). The southeast region also appears to be drawing hunters from other areas of the state (e.g., 77% of respondents indicated they did not live in the area they hunt).

There was a notable difference in the overall response rate among the 3 treatment groups (74% mail-back, 65% mixed-mode, and 44% internet only), but there was an inverse relationship in terms of the cost of conducting each survey. The estimated cost per useable return was $1.96 for the internet-only survey, $2.24 for the mixed-mode survey, and $2.75 for the mail-back survey. We included costs for printing services, postage, envelopes, and data entry services, but we did not include programming cost ($420) for the internet database because we used the same database to store returns from all 3 treatment groups. Although the cost per useable return was lowest for the internet-

only survey, we caution that cost is only one of several factors that should be considered when choosing a survey design. For example, the low response rate in the internet-only survey and information from the follow-up survey (security concerns, technical difficulties, no computer) raises concerns about the potential for non-response bias in the internet-only survey. Likewise, the low response rate in the internet-only survey means that more effort would be needed to obtain a similar sample size and level of precision as in the mail-back survey, and whether such additional costs would be linear with respect to estimated cost/useable return is not clear. For example, you would likely need to mail out more surveys initially and conduct >1 follow-up survey, both of which would increase mailing and non-respondent costs.

Within the internet treatment there were some hunters that reported an inability to access the survey site. In follow-up phone conversations with hunters who called looking for assistance in locating the website, it was discovered that the problem was due to hunters using an internet search engine (i.e., Google, Bing, Yahoo, etc) to type the web address provided on the survey card rather than using browser address bar. The survey website was not indexed on search engines and consequently hunters were unable to find the site. A link to the survey website was placed on the MNDNR Farmland Wildlife Populations and Research Group and the MNDNR Wild Turkey web pages (the 2 most common sites visited by hunters looking for the survey website), which re-directed respondents to the correct URL. Undoubtedly this contributed to the lower response rate in the internet treatment group (e.g., additional hunters tried to access the internet survey, could not, and disposed of survey postcard). We also asked hunters that received a mailback survey if they would respond to the survey if they received a postcard directing

them to a computer website; 77% indicated "yes" they would respond, 22% "no", and 1% did not answer the question. This suggests that most hunters are willing to respond to an internet-based survey, but technical problems must be resolved and tradeoffs involving non-response bias, precision, and costs should be more carefully evaluated before committing to an internet-only survey design.

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Table 1. Spring wild turkey hunter's surveyed (*n*) and response rate (%) by permit area, mailing, and treatment group for the 2010 spring wild turkey season, Minnesota.

	Mailback[a]		Mixed-mode[b]		Internet[c]	
Permit area	*n*	%	*n*	%	*n*	%
1st mailing						
344	151	58	154	23	154	30
345	163	51	161	27	161	21
346	156	51	155	23	157	22
348	160	61	161	25	161	29
349	177	60	175	34	175	24
Total	807	56	806	27	808	25
2nd mailing						
344	62	39	119	50	108	28
345	79	41	117	53	125	20
346	75	39	119	48	119	24
348	60	48	121	64	113	24
349	69	39	114	48	133	28
Total	345	41	590	53	598	25
Overall						
344	151	74	154	62	154	49
345	163	71	161	66	161	37
346	156	70	155	60	157	41
348	160	79	161	73	161	46
349	177	76	175	66	175	45
Total	807	74	806	65	808	44

[a] Hunters received a postage-paid paper mailback survey for both mailings.
[b] Hunters received a postcard with a website address and unique survey identification number on the first mailing. Non-respondents received a postage-paid mailback survey for the second mailing.
[c] Hunters received a postcard with a website address and a unique survey identification number and were asked to go to the website to complete the survey.

Table 2. Mean hunt-quality scores, interference rates, and ease of access (to hunting land) by treatment group for the 2010 spring wild turkey season, Minnesota.

Treatment group	Mean hunt quality score	Interference rates (%)	Ease of access to hunting land (%)				
			Very difficult	Somewhat difficult	Somewhat easy	Very easy	Total (*n*)
Mailback	3.2	11	4	22	31	43	592
Mixed-Mode	3.4	13	4	23	33	40	518
Internet	3.4	10	4	20	30	46	352

Table 3. The most important factors hunters selected in determining a quality spring turkey hunt by permit area during the 2010 spring wild turkey season, Minnesota.

Most important factor in determining quality	Permit area				
	344	345	346	348	349
An opportunity to kill a turkey	18%	10%	10%	9%	14%
Seeing turkeys/calling birds in/hearing gobbling	1%	53%	63%	56%	56%
Killing a turkey (Tom, Jake, Bearded hen)	1%	1%	2%	1%	1%
Killing a mature Tom	4%	4%	2%	3%	3%
Weather	3%	6%	3%	5%	4%
Not seeing other hunters	3%	1%	1%	2%	2%
Not being interfered with by other hunters	7%	5%	3%	3%	2%
Spending time with family and friends	54%	10%	9%	12%	10%
Access to private hunting land	1%	3%	3%	2%	3%
Being successfully drawn to hunt an early time period	9%	6%	4%	7%	5%
Total (*n*)	253	277	258	313	325

Table 4. Number of hunters that indicated another hunter kept them from hunting where they wanted by permit area during the 2010 spring wild turkey season, Minnesota.

Permit area	Definitely Yes	Somewhat	Not Much	Not at All
344	29	63	72	116
345	20	37	59	161
346	17	39	53	150
348	23	39	61	191
349	19	48	61	197
Total (*n*)	108	226	306	815

Table 5. Hunters who indicated another hunter interfered with their chance to harvest a turkey, type of land where interference occurred, and number of days interference occurred by permit area during the 2010 spring wild turkey season, Minnesota.

Permit area	Another hunter interfered with chance to harvest a turkey		Type of land interference occurred on			Number of days interference occurred		
	Yes	No	Public	Private	Interference didn't occur	Mean	Range	# reporting zero days
344	49	231	58	7	215	0.65	0 - 7	172
345	28	249	11	33	233	0.38	0 - 4	202
346	27	232	7	31	221	0.33	0 - 7	206
348	30	285	16	33	264	0.39	0 - 5	235
349	32	294	13	29	284	0.34	0 - 4	256
Total (*n*)	166	1291	105	133	1217			1051

Table 6. Ease of access to hunting land and type of land hunted by permit area during the 2010 spring wild turkey season, Minnesota.

Permit area	Ease of access to hunting land				Type of land hunted		
	Very difficult	Somewhat difficult	Somewhat easy	Very easy	Private	Public	Both
344	7	61	102	111	59	165	57
345	15	66	83	114	244	10	24
346	8	54	84	115	233	5	23
348	11	70	94	141	232	35	50
349	15	70	99	142	264	26	37
Total (*n*)	56	321	462	623	1032	241	191

Table 7. Number of private land hunters who indicated they were the landowner or tenant of the land they hunted, and number of public land hunters who indicated they hunted public land exclusively because they could not gain access to private land during the 2010 spring wild turkey season, Minnesota.

Permit area	Private land hunters			Public land hunters[a]	
	Landowner	Tenant	Neither	Yes	No
344	6	4	106	83	134
345	35	5	228	10	35
346	39	8	210	9	23
348	37	11	233	30	58
349	39	9	253	23	52
Total (*n*)	156	37	1030	155	302

[a] Respondents were asked "yes" or "no" if they hunted public land exclusively because they could not access private land

Table 8. Hunters perception of changes in turkey numbers by permit area over the last 3 spring wild turkey seasons, Minnesota.

Permit area	Increased	Decreased	About the same	Didn't hunt the Same PA
344	31	64	151	34
345	32	95	129	20
346	24	100	126	10
348	46	96	150	23
349	20	154	134	18
Total (*n*)	153	509	690	105

Table 9. Respondents that live in the permit area they hunted in 2010, number of seasons respondents applied or hunted in the area they hunted in 2010, and total number of spring wild turkey seasons hunted by permit area during the previous 3 (2007-2009) seasons.

Permit area	Live in PA they hunted		# of seasons (2007-2009) applied or hunted in PA they hunted in 2010				# of seasons hunted in last 3 spring seasons (2007- 2009)			
	Yes	No	0	1	2	3	0	1	2	3
344	45	236	43	65	49	120	46	87	40	102
345	107	171	42	35	54	143	35	33	58	149
346	65	196	21	36	40	159	18	36	46	156
348	52	265	39	82	61	135	34	102	70	108
349	65	262	32	45	53	191	29	63	66	161
Total (*n*)	334	1130	177	263	257	748	162	321	280	676

Appendix A.

Minnesota Spring Turkey Hunter Survey

Please respond to all the questions based on the spring 2010 turkey season

1. Did you hunt turkeys in Minnesota during the spring 2010 season?
   Yes____ No*____

   * If you did not hunt during the 2010 spring turkey season please do not continue

2. Did you successfully harvest a turkey during the 2010 spring wild turkey season?
   Yes____ No____

3. How many days did you hunt during the 2010 spring wild turkey season (check only one)?
   1____ 2____ 3____ 4____ 5____ 6____ 7____

4. In which of the past 3 spring turkey hunting seasons did you hunt in Minnesota (check all that apply)?
   2007____ 2008____ 2009____

5. During which of the 3 past spring turkey seasons (2007-2009) did you apply and/or hunt in the permit area where you hunted in 2010 (check all that apply)?
   2007____ 2008____ 2009____

6. Do you live in the permit area in which you generally apply and hunt?
   Yes____ No____

7. How difficult was it to find a place to hunt during the 2010 spring turkey season (check only one)?
   Very difficult____ Somewhat difficult____ Somewhat easy____ Very easy____

8. What type of land did you hunt during the 2010 spring season (check only one)?
   Private land____ Public land____ Both____

9. If you hunted private land, were you the landowner or the tenant of the land (check only one)?
   Landowner____ Tenant____ Neither____ I did not hunt on private land____

10. If you hunted public land exclusively was it because you could not gain access to private land (check only one)?
    Yes____ No____ I did not hunt on public land____

11. Over the last 3 spring turkey seasons do you feel turkey numbers have changed in the permit area you hunt (check only one)?
    Increased____ Decreased____ About the same____ Did not hunt same PA____

12. During the 2010 spring turkey season, did other hunters keep you from hunting where you wanted to hunt (check only one)?
    Definitely Yes____ Somewhat____ Not Much____ Not at All____

13. Did another hunter interfere with your chance to harvest a turkey?
    Yes____ No____

14. If yes, what type of land were you hunting when another hunter interfered with your chance to bag a turkey (check only one)?
    Public____ Private____ Interference did not occur____

15. How many days did you experience interference from another turkey hunter while hunting during the 2010 spring turkey season (check only one)?
    0____ 1____ 2____ 3____ 4____ 5____ 6____ 7____

16. Rate the quality of your turkey hunting experience during spring 2010 on a scale of 1- 5
    (check only one number):

    Poor Quality Average Quality Excellent Quality

    1____ 2____ 3____ 4____ 5____

17. What is the most important factor in determining a quality spring turkey hunting experience in Minnesota for you (check only one)?
    An opportunity to kill a turkey____
    Seeing turkeys/calling birds in/hearing gobbling____
    Killing a turkey (Tom, Jake, Bearded hen)____
    Killing a mature Tom____
    Weather____
    Not seeing other hunters____
    Not being interfered with by other hunters____
    Spending time with family and friends____
    Access to private hunting land____
    Being successfully drawn to hunt an early time period____

18. In the future, would you respond to this survey if you received a postcard directing you to a computer website to fill out the survey?
    Yes____ No____

Appendix B.

Minnesota Spring Wild Turkey Hunter Follow-Up Survey

1. What were your reasons for not responding to the initial survey? (*check all that apply*)
    a. Did not want to participate in the survey_____
    b. Do not own a computer or have access to the internet_____
    c. Concerned about privacy issues associated with using the internet_____
    d. Encountered technical problems trying to access the survey site_____
    e. Other (please state)_____

2. If you checked item *d* above, please describe the problems you encountered.

    _____
    _____
    _____

3. If you attempted to access the survey web site through the internet, which of the methods listed below did you use? (*check only one*)

    a. Typed web address provided on postcard into the browser address bar_____

    b. Typed web address on the postcard into a search engine (e.g., Google, Yahoo, Bing, etc)_____
    c. Other (please state)_____
    d. Did not try to complete the survey_____

4. Do you have comments or suggestions on how to make the internet–based survey easier to use?